Iowa Farm Science

Volume 11 | Number 11 Article 2

5-1957

New Area Recommendations For Oats

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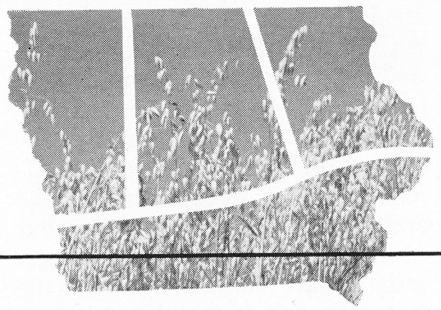

New AREA Recommendations for oats

Beginning in the fall of 1957, Iowa State College oat variety recommendations will be made on the basis of four state areas. Who determined the areas? Why, none other than the oat varieties themselves.

by K. J. Frey and T. W. Horner

A NEW method will be used in making oat variety recommendations in Iowa beginning next fall. Specific oat variety recommendations will be made for each of four areas of the state. Even newer than the idea of making recommendations by areas of the state is the method used to determine the four areas.

Several midwestern states have been making oat variety recommendations on an area basis recently. Area divisions of the state have been based on obvious climatic and soil differences. And this procedure works fine for states with a long north-south axis with relatively well-defined climatic areas or with sharp soil class regions.

Iowa Is Different

Iowa, however, doesn't have widely differing climatic belts which might be used to make precise divisions of the state into oat areas. As a result, we decided to find out if the oat varieties themselves could determine a natural pattern of areas for variety recommendations.

The result has made possible the establishment of four areas—northwestern, north-central, northeastern and southern — for oat variety recommendations in Iowa. Essentially, the question was, "Do some oat varieties rank higher in grain yields in one area than in another?" Previous results had already indicated that an oat variety reacts in much the same way to factors affecting lodging, test weight and disease—regardless of the area of the state in which planted.

The different yield reactions of oat varieties to soil and climatic factors, however, are complicated at best. We'd be hard-pressed to define a large fraction of these reactions in terms of any single factor. So why not let the oats themselves react or respond as they will and "tabulate" the results for us in terms of their yields? And this is what we did.

Finding the Areas . . .

We compared oat yields at the nine locations shown in the map for the years 1950 through 1955. Eighteen oat varieties were used in each test. Varieties used were those either recommended for Iowa or those recently released from one of the nearby states.

Oat diseases were severe in 1950 and 1953. In 1955 Iowa had the highest average oat yield in 25 years; 1951 and 1954, on the other hand, were just about "normal." So the 5 years considered together are fairly representative for Iowa.

When an oat variety yields well in one area, medium in another and poorly in a third, while another variety does the opposite, plant breeders call it "variety x location" interaction. When test locations are grouped in a manner to give the smallest variety-location interaction, it means that varieties rank about the same at all locations within a particular grouping. So our job amounted to the task of dividing Iowa into areas where varieties tended to rank the same for yield.

By trial and error we arrived at the divisions shown in the map. The three southern test locations formed the basis for the horizontal southern area. The other six locations are paired off on a north-south basis to form the northwestern, north-central and northeastern areas.

Once this was done, there was another question to answer: "Is the pattern of areas selected by variety-location interactions also

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the best one for consistent average yields?" The answer seems to be "yes."

The average yields for 13 varieties grown in the Iowa variety trials from 2 to 5 years, including 1956, are listed in table 1. Not all of the varieties shown are recommended at the present time. Those recommended for Iowa planting in 1956 included only Bonham, Cherokee, Nemaha, Clintland, Clarion, Mo. O-205 and Sauk; the Burnett and Newton varieties are new ones and will be recommended when the seed supply is sufficiently large.

The Results . . .

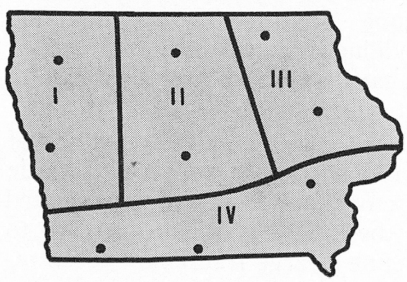
Notice, in table 1, the place of late varieties in Iowa. Sauk, the better of the two late varieties, yielded 9 bushels more per acre than the best midseason variety in the northeastern area. It yielded about the same as the best midseason variety in the north-central and southern areas but 9 bushels less in the northwestern area. This indicates that oat growers in northeastern Iowa can achieve higher yields per acre by growing the late-season variety, Sauk, rather than midseason or early varieties. In the other areas, however, there's no advantage in growing a late variety.

Note also, in table 1, how some of the early and midseason varieties yielded well in all areas. Bonham, Mo. O-205 and Burnett are good examples. In northwestern and north-central Iowa, all of the early varieties produced about the same yield. So, in these two areas, which one to grow is a "toss-up." In northeastern and southern Iowa, Bonham was superior to Cherokee and produced somewhat better yields than Nemaha.

The best-yielding midseason varieties in northwestern Iowa were Mo. O-205 and Burnett. Newton yielded poorly in this area—25 bushels less than Burnett. Clarion didn't do so well in this area, either.

But in contrast, look at the yields of Newton and Clarion in northeastern and southern Iowa. They were as good as or better than any other midseason variety.

Newton appears poorly adapted in northwestern Iowa, medium in the north-central area but one of the best varieties for both the northeastern and southern areas. Clarion's yields are only medium in the northwestern and north-central areas but are good in the northeastern and southern sections. Mo. O-205 and Burnett produced good yields in all areas, while Clintland yielded from 9 to 20 bushels less than the best varieties in all areas.



Other factors besides yield that are important in selecting an oat variety include those such as test weight, straw stiffness and disease resistance. But we've already pointed out that an oat variety reacts similarly to the factors affecting these regardless of the area where planted. Thus, our results concerning these characteristics are summarized for the state as a whole in table 2.

How to Choose . . .

Probably much more important than choosing the "best" single oat variety for your area is deciding *first* which ones should *not* be grown in your area. Then make your choice of two or more of the remaining ones. *Oat variety diversification is still essential for the control of oat rusts in the state!* With the disease situation such as it is, it simply is *not wise* to put "all of your eggs in one basket," so to speak, and to gamble your stake on one single variety, no matter how good it looks. The odds just aren't favorable enough in the face of the oat rust picture. We think you'll be wiser to "hedge" as we've recommended in the past and still do.

Our oat variety recommendations, meanwhile, may vary from year to year both as the oat situation changes and as new varieties become available. Later, it may be necessary to modify the area boundaries as new varieties with different reactions become available.

TABLE 1. Yields in bushels per acre of oat varieties tested in different areas of Iowa, 1952-1956.

Variety	Area I Northwest	II North-central	III Northeast	IV Southern
Early:				
Bonham	60	80	77	72
Cherokee	59	77	72	66
Minland	65	77	66	72
Nemaha	58	80	75	70
Midseason:				
Bentland	63	70	69	65
Burnett	80	87	80	79
Clarion	69	81	80	82
Clintland	60	79	75	73
Clinton	55	71	64	69
Mo. 0-205	75	88	81	82
Newton	55	81	84	78
Late:				
Garry	56	82	84	71
Sauk	71	89	93	83

TABLE 2. Average performance of oat varieties in Iowa, 1952-1956.

Variety	Plant height (inches)	Lodging (%)	Test weight (lbs./bu.)	Stem[a] rust	Crown[b] rust
Early:					
Bonham	34	10	35.0	8R	MS
Cherokee	31	4	34.5	8R	MS
Minland	36	2	30.0	7&8R	R
Nemaha	32	3	34.5	8R	MS
Midseason:					
Bentland	36	11	34.4	8R	R
Burnett	35	9	35.0	7&8R	MR
Clarion	35	2	34.9	7R	S
Clintland	34	4	35.3	8R	R
Clinton	33	1	32.8	8R	S
Mo. 0-205	34	3	35.0	7R	MR
Newton	34	3	33.8	7R	MR
Late:					
Garry	39	4	31.4	7&8R	MR
Sauk	36	7	32.1	7R	MR

[a]Resistant to numbered races of stem rust shown.
[b]R = resistant, S = susceptible, M = moderately.